

**Response**

Applicant: VanWinkle T. Townsend

Serial No.: 09/847,751

Filed: May 2, 2001

Docket No.: L250.109.101 (FE-00494)

Title: TELEMETRY SYSTEM AND METHOD FOR ACOUSTIC ARRAYS

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**REMARKS**

The following remarks are made in response to the Non-Final Office Action mailed October 18, 2005. In that Office Action, the Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by W. Lin et al., "System Design and Optimization of Optical Amplified WDM-TDM Hybrid Polarization-Insensitive Fiber-Optic Michelson Interferometric Sensor", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000 ("Lin"). Claims 1 and 5-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al., U.S. Patent No. 4,628,493 ("Nelson") and McArthur et al., U.S. Patent No. 5,272,476 ("McArthur"). Claims 2-3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 ("Sonderegger"). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Guy, U.S. Patent No. 6,690,886 ("Guy"). Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Nakamura et al., U.S. Patent No. 5,784,188 ("Nakamura"). Claims 10-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Green et al., U.S. Patent No. 6,515,939 ("Green"). Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nakamura.

With this Response, Applicant respectfully traverses the Examiner's rejection of claims 1-25. Claims 1-25 remain pending in the application and are presented for reconsideration and allowance.

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**35 U.S.C. §102 Rejections**

The Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by Lin et al., Journal of Lightwave Technology publication (“Lin”). Independent claim 12 is directed to a “system for remotely retrieving data from an **array of sensors**” and recites “a plurality of **optical modulators**, each optical modulator configured to receive one of the plurality of streams of optical pulses, each optical modulator configured to receive sensor information from at least one of the sensors, each optical modulator configured to modulate the received stream of optical pulses based on the received sensor information and thereby generate a modulated stream of optical pulses.” Independent claim 20 is directed to a “method for remotely retrieving data from an **array of sensors**” and recites “receiving the plurality of streams of optical pulses with a plurality of **optical modulators**” and “modulating each of the received streams of optical pulses with the plurality of optical modulators based on sensor information generated by the array of sensors, and thereby generating a plurality of modulated streams of optical pulses.” The Examiner previously admitted that Lin fails to teach modulators. (Office Action mailed 6/15/04 at page 4). Now, the Examiner states that “Lin et al. teaches in FIG. 1 Michelson interferometric sensors which act as modulators.” (Office Action, page 2).

Independent claims 12 and 20 each separately recite both an “array of sensors” and “a plurality of optical modulators”. If the Examiner contends that the sensors disclosed in Lin correspond to the optical modulators recited in claims 12 and 20, then Applicant respectfully submits that Lin does not teach or suggest an array of sensors. If the Examiner contends that the sensors disclosed in Lin correspond to the array of sensors recited in claims 12 and 20, then Applicant respectfully submits that Lin does not teach or suggest optical modulators. Lin does not teach or suggest both an array of sensors **and** a plurality of optical modulators as recited in claims 12 and 20.

In view of the above, independent claims 12 and 20 are not taught or suggested by Lin. Applicant respectfully traverses the rejection of claims 12 and 20, and reconsideration and allowance of claims 12 and 20 is respectfully requested. Since dependent claims 16-18 further define patentably distinct claim 12, and claims 22-24 further define patentably distinct claim 20, and are further distinguishable over the cited prior art, these dependent claims are believed to be

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allowable over the cited references. Reconsideration and allowance of claims 16-18 and 22-24 is respectfully requested.

**35 U.S.C. §103 Rejections**

The Examiner rejected claims 1 and 5-8 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al, U.S. Patent No. 4,628,493 (“Nelson”) and McArthur et al., U.S. Patent No. 5,272,476 (“McArthur”). Claim 1 recites “**a plurality of acoustic sensors** for receiving acoustic information and generating analog signals based on the received acoustic information”, “**a first plurality of subsystems** coupled to at least a subset of the plurality of acoustic sensors, the first plurality of subsystems configured to receive the analog signals from the acoustic sensors and generate digital values based on the received analog signals, and “each subsystem in the first plurality of subsystems configured to modulate the first set of optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.” For the same reasons as discussed above with reference to claims 12 and 20, Lin fails to teach or suggest these claim limitations. If the Examiner contends that the sensors disclosed in Lin correspond to the plurality of subsystems recited in claim 1, then Applicant respectfully submits that Lin does not teach or suggest a plurality of sensors. If the Examiner contends that the sensors disclosed in Lin correspond to the plurality of sensors recited in claim 1, then Applicant respectfully submits that Lin does not teach or suggest a plurality of subsystems. Lin does not teach or suggest both a plurality of sensors **and** a plurality of subsystems as recited in claim 1. Nelson and McArthur also fail to teach or suggest these limitations.

In view of the above, independent claim 1 is not taught or suggested by Lin, Nelson, and McArthur, either alone, or in combination. Applicant respectfully traverses the rejection of claim 1, and reconsideration and allowance of claim 1 is respectfully requested.

Claim 8 recites “wherein each subsystem in the first plurality of subsystems includes an optical modulator for modulating the first set of optical pulses based on the generated digital values.” For the same reasons as discussed above with reference to claims 12 and 20, Lin fails to teach or suggest this claim limitation.

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Since dependent claims 5-7 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 5-8 is respectfully requested.

Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1 and 5-8, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 ("Sonderegger"). Since dependent claims 2 and 3 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 2 and 3 is respectfully requested.

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1, and 5-8, and further in view of Guy, U.S. Patent No. 6,690,886 ("Guy"). Since dependent claim 4 further defines patentably distinct claim 1, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 4 is respectfully requested.

Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claim 1 above, and further in view of Nakamura et al., U.S. Patent No. 5,784,188 ("Nakamura"). Claim 9 recites "wherein each optical modulator modulates the first set of optical pulses by passing and blocking optical pulses in the first set of optical pulses." With respect to claim 9, the Examiner stated that:

The difference between Lin et al., Nelson et al. and McArthur et al. and the claimed invention is that Lin et al., Nelson et al. and McArthur et al. do not teach a modulator that modulates by passing and blocking optical signal. However, it is well known in the art that electro-absorption (EA) modulators are widely used for modulating optical signal by blocking (absorbing) or passing optical signal. For example, Nakamura et al. disclosed in FIG. 1 an EA modulator. (Office Action, pages 6-7).

First, the Examiner has not cited anything in Nakamura that teaches or suggests that the electro-absorption modulator (EA modulator) disclosed therein is configured to modulate a set of optical pulses by passing and blocking optical pulses. Second, there is no suggestion to combine the cited references in the manner proposed by the Examiner. As pointed out above, the

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Examiner has acknowledged that Lin, Nelson, and McArthur do not teach a modulator that modulates by passing and blocking optical signals. Lin, Nelson, and McArthur do not include any teaching or suggestion that the systems disclosed therein could or should be modified to include modulators that block or pass an optical signal, nor do Lin, Nelson, and McArthur include any suggestion that it would be desirable to add modulators that pass and block an optical signal. There is no teaching or suggestion in Nakamura that the disclosed EA modulator could or should be used in a polarization-insensitive fiber-optic Michelson interferometric sensor (PIFOMIS) system like that disclosed in Lin. Rather, Nakamura discloses that the EA modulator is configured to be used in the digital transmission of moving pictures (See, e.g., Nakamura at col. 5, lines 9-13 and lines 63-67).

In view of the above, dependent claim 9 is not taught or suggested by Lin, Nelson, McArthur, and Nakamura, either alone, or in combination. Since dependent claim 9 further limits patentably distinct claim 1, and is further distinguishable over the cited prior art, dependent claim 9 is believed to be allowable over the cited references. Applicant respectfully traverses the rejection of claim 9, and reconsideration and allowance of claim 9 is respectfully requested.

Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8, and further in view of Green et al., U.S. Patent No. 6,516,939 ("Green"). Since dependent claims 10 and 11 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 10 and 11 is respectfully requested.

Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Since dependent claim 13 further defines patentably distinct claim 12, and dependent claim 21 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 13 and 21 is respectfully requested.

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Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Since dependent claim 14 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 14 is respectfully requested.

Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Since claim 15 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 15 is respectfully requested.

Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nakamura. Claim 19 depends from claim 12 and recites “wherein each optical modulator modulates the received stream of optical pulses by passing and blocking optical pulses in the received stream.” Claim 25 depends from claim 20 and recites “wherein each of the received streams of optical pulses is modulated by passing and blocking optical pulses in the received streams.” With respect to claims 19 and 25, the Examiner stated that:

The difference between Lin et al. and the claimed invention is that Lin et al. does not teach to modulate received optical pulses by passing and block optical pulses. However, it is well known in the art that electro-absorption (EA) modulators are widely used for modulating optical signal by blocking (absorbing) or passing optical signal. For example, Nakamura et al. disclosed in FIG. 1 an EA modulator. (Office Action, page 10).

As previously discussed with reference to claim 9, the Examiner has not cited anything in Nakamura that teaches or suggests that the electro-absorption modulator (EA modulator) disclosed therein is configured to modulate a set of optical pulses by passing and blocking optical pulses, and there is no suggestion to combine the cited references in the manner proposed by the Examiner. In addition, the proposed modification to Lin would also change the principle of operation disclosed in Lin, as well as require a substantial reconstruction and redesign of the system disclosed in Lin. The MPEP states that “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” MPEP §2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). The MPEP also

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states that, in the *Ratti* case, “[t]he court reversed the rejection holding the ‘suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.’” MPEP §2143.01, citing *In re Ratti*, 270 F.2d at 813, 123 USPQ at 352.

In view of the above and since dependent claim 19 further defines patentably distinct claim 12, and dependent claim 25 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 19 and 25 is respectfully requested.

**CONCLUSION**

In view of the above, Applicant respectfully submits that pending claims 1-25 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-25 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to contact the Applicant’s representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Response should be directed to Jeff A. Holmen at Telephone No. (612) 573-0178, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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**Dicke, Billig & Czaja, PLLC**

Fifth Street Towers, Suite 2250

100 South Fifth Street

Minneapolis, MN 55402

Respectfully submitted,

VanWinkle T. Townsend,

By his attorneys,

DICKE, BILLIG & CZAJA, PLLC

Fifth Street Towers, Suite 2250

100 South Fifth Street

Minneapolis, MN 55402

Telephone: (612) 573-0178

Facsimile: (612) 573-2005

Date: 1/3/06

JAH:jmc

Jeff A. Holmen  
Jeff A. Holmen

Reg. No. 38,492

CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 3rd day of January, 2006.

By: Jeff A. Holmen

Name: Jeff A. Holmen